SERGI MOLINS RAFA

Earth Sciences Division
Lawrence Berkeley National Laboratory
One Cyclotron Road, Mail Stop 90R1116
Berkeley, CA 94720 USA
Phone: 510-486-7540
SMolins@lbl.gov

EDUCATION

Ph.D., University of British Columbia	2007
Civil Engineer, Technical University of Catalonia	2001

PROFESSIONAL EXPERIENCE

Post-doctoral Fellow, Lawrence Berkeley National Laboratory	2008- pres.
Teaching & Research Assistant, University of British Columbia	2002- 2007
Research Assistant, Technical Univ. of Catalonia & CSIC-Earth Sci. Inst. 'Jaume Almera'	2001- 2002

RESEARCH

I am interested in the investigation of the coupling between fluid flow, solute transport and geochemical processes in subsurface environments at different scales by means of reactive transport modeling. I am currently developing the tools to perform direct numerical simulation of flow, transport and geochemical reactions at the pore scale. These modeling tools are being used to quantify porosity and permeability changes due to geochemical reactions, and in turn their effect on upscaled reaction rates (Molins and Silin, 2009; Trebotich et al., 2010). Previously, I have investigated the feedback mechanisms between geochemical reactions and gas transport in the vadose zone (Molins and Mayer, 2007; Molins et al., 2008; Molins et al., 2010). I have also worked on the development of an efficient formulation for reactive transport problems that maximized the number of equations decoupled from chemical reaction terms (Molins et al., 2004), and implemented a geochemical speciation model to automate the selection of primary species for a reactive transport code. I am familiar at the user and developer level with several reactive transport codes (Min3p, CrunchFlow, Retraso).

ARTICLES

Molins, S., K.U. Mayer, R.T. Amos, and B.A. Bekins (2010), Vadose zone attenuation of volatile organic compounds at a crude oil spill site – Interactions between multicomponent gas transport and biogeochemical reactions, *J. Contamin. Hydrol.*, 112: 15-29

Molins, S., K. U. Mayer, C. Scheutz, and P. Kjeldsen (2008), Transport and reaction processes affecting the attenuation of landfill gas in cover soils, *J. Environ. Qual.*, 37(2): 459-468.

Molins, S., and K.U. Mayer (2007), Coupling between geochemical reactions and multi-component gas and solute transport in unsaturated media: a reactive transport modeling study, *Water Resour. Res.*, 43(5), W05435.

Molins, S., J. Carrera, C. Ayora, and M.W. Saaltink (2004), A formulation for decoupling components in reactive transport problems, *Water Resour. Res.*, 40 (10), W10301.

RECENT CONFERENCE CONTRIBUTIONS

Molins. S, J. Ajo-Franklin, R.T. Armstrong, P. Nico, and D. Silin (2010), Biogeochemically-driven evolution of pore structures and flow paths: experimental studies and modeling, Abstract H41D-1110 presented at *2010 Fall Meeting, AGU*, San Francisco, Calif., 13-17 Dec.

Trebotich, D., S. Molins, G. Miller, and C. Steefel, (2010), An adaptive finite volume approach to simulation of precipitation and dissolution at the pore scale, Abstract H52E-06 presented at *2010 Fall Meeting, AGU*, San Francisco, Calif., 13-17 Dec.

L.Yang, S. Molins, H. R. Beller, E. L. Brodie, C. I. Steefel, P. S. Nico, and R. Han (2010), Flow-through Column Experiments and Modeling of Microbially Mediated Cr(VI) Reduction at Hanford 100H, Abstract B51C-0381 presented at *2010 Fall Meeting, AGU*, San Francisco, Calif., 13-17 Dec.

Steefel, C., C.N. Noiriel, L. Yang, D. Trebotich, S. Molins, and J. Ajo-Franklin, (2010), Integrating Experiments, Characterization, and Modeling to Understand Carbonate Precipitation at the Pore Scale (Invited), Abstract H11J-03 presented at 2010 *Fall Meeting, AGU*, San Francisco, Calif., 13-17 Dec.

Molins, S., and D. Silin (2009), Pore-scale modeling of biogeochemical alteration of the transport properties of sediment, *Eos Trans. AGU, 90(52)*, Fall Meet. Suppl., Abstract H13B-0949.

PROFESSIONAL ACTIVITIES

Member: *American Geophysical Union*.

Reviewer*: Water Resour. Res., Environ. Sci. Technol., Am. J. Sci., Waste Management, J. Hydrol., Hydrol. & Earth System Sci., J. Contamin. Hydrol., and J. Environ. Quality.*

Convener of the special session *"Modeling of Subsurface Biogeochemical Processes"* at the XVIII Conference on Computational Methods in Water Resources (CMWR 2010), Barcelona, June 21-24, 2010.

FELLOWSHIPS

Egil H. Lorntzsen Scholarship (UBC, 2006), University Graduate Fellowship (UBC, 2003-2005), Thomas and Marguerite MacKay Memorial Scholarship (UBC, 2003)

web: 2011-04-05